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EXAMINER

ROMANO, JOHN J

ART UNIT	PAPER NUMBER
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2192

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,292	Applicant(s) CHOI ET AL.	
	Examiner John J. Romano	Art Unit 2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment and response received April 25th, 2007 responding to the January 25th, 2007, Office action provided in the rejections of claims 1-11, wherein claims 1 and 6 are amended, claim 7 is cancelled, and claims 1-6 and 8-11 remain pending in the application and which have been fully considered by the examiner.

Applicant arguing for the claims being patentable over *the prior art* (see pages 6-8 of the amendment and response) are not persuasive, as will be addressed under Prior Art's Arguments – Rejections section at item 2 and the claim rejections below. Accordingly, Applicants' amendments necessitated additional clarifications. Thus, the rejection of the claims over prior art in the previous Office action is maintained in light of the necessitated additional clarifications provided hereon and **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2192

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

As an initial matter, the following claim language terms and their corresponding interpretations, used by the examiner in the present action, are identified:

Auxiliary = supporting.

Separate = distinguishable.

Load = input data to a memory for execution.

Cache = memory area where frequently accessed data can be stored for rapid access.

Prior Art's Arguments – Rejections

2. Applicant's arguments filed January 25th, 2007, in particular on pages 6-7, have been fully considered but they are not persuasive. For example,

(A) In regard to the argument "that *Blais* does not disclose a second memory unit and a separate first memory unit", (emphasis in original - See response, page 7, 1st paragraph), the Examiner respectfully disagrees. It should be noted that the plain language of the claim limitation separate is interpreted by the examiner, as distinguishable (emphasis added). As such, the cache 126 is clearly distinguishable from the main memory 120, processor 110, and class processing mechanism 129. Even arguably, if the applicant is intending to imply that the memories are *different physical memory chips*, the disclosure of *Blais* would at least have suggested to one of

ordinary skill in the art, at the time the invention was made, to look to the known methods of class loading in a java virtual machine (i.e., See Column 2, lines 35-47 + Column 2, lines 63-67 + Column 5, lines 57-61) to further enable *Blais*' objective of increasing the performance of Java Virtual Machines (JVM) by eliminating needless processing of Java classes which have already been processed (See Column 2, lines 65-67).

Even arguably, the old and well known methods of implementing a JVM by loading data from a first memory into a second memory would have been obvious. As evidence of the above statement and further support of the examiner's arguments see *Rodriguez*, figure 2 & Column 2, lines 12-48, wherein a JVM includes a class loader subsystem 202, for loading classes into the first memory (runtime data areas) 204 from a second memory. *Rodriguez* expressly defines the run-time data areas to "represent the organization of memory needed by JVM 200 to execute a program (emphasis added, Column 4, lines 27-28). Even if that memory is a reference to a different memory, it is still a distinguishable or separate (second) memory. Accordingly, the rejection is maintained as addressed herein-above and below in the claim rejections, in light of the instant argument.

(B) In regard to applicant's argument that "there is no teaching or suggestion that runtime data that is stored in the cache is loaded into the first memory unit upon the request of a class loader unit" (see response, page 7, first paragraph), the examiner respectfully disagrees. The class processing of mechanism (class loader unit) of *Blais* searches the processed class entries stored in the cache (126) and loads the runtime

data as acknowledged by applicant (See response, page 7, first paragraph).

Additionally, it is noted that *Blais* expressly discloses “retrieved and used” (column 3, line 20) when referring to the cache entry when “loading a class” (column 3, line 9). Of particular interest is *Blais*’ express disclosure of the information being “stored in a cache separate from any class file” (emphasis added, Column 3, line 8). Here, it is clear that the data is loaded or retrieved from a separate cache and used. If the data did not need to be loaded or transferred into an execution area (i.e., execution engine, run-time data, etc...) then, it would not need to be retrieved because it would already be present. The act of load or retrieving the cached (stored) data necessarily requires conveying the data to a second memory. Accordingly, the arguments are not persuasive and the rejection is maintained as addressed herein.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims **1, 3, 6, 9 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Blais et al.*, US 7,065,743 (hereinafter **Blais**) in view of *Sauntry et al.*, US6,349,344 (hereinafter **Sauntry**).

In regard to claim 1, **Blais**) discloses:

- *"A system for shortening a class loading process in a Java program, comprising: a class loader unit for loading Java program class files from an auxiliary memory, performing...and initialization processes and generating runtime data..."* (E.g., see Figure 4 & Column 7, lines 60-Column 8, line 13), wherein the process begins upon class loading, wherein initialization processes and runtime information is generated.
- *"...a first memory unit for maintaining the runtime data generated by the class loader unit in an accessible state..."* (E.g., see Figure 1, element 120 & Column 6, lines 30-40), wherein the main memory stores the necessary runtime information and data that processor 110 may access.
- *"...a second memory unit for storing the runtime data, which have been loaded into the first memory unit in the accessible state ..."* (E.g., see Figure 3 (127) & Column 7, lines 19-31), wherein the cache is a second memory unit storing the already processed runtime data (analyzed program).
- *"...a runtime data search unit for loading the runtime data, which have been stored in the second memory unit ... into the first memory unit upon the request of the class loader unit..."* (E.g., see Figure 5 & Column 8, lines 42-44), wherein the runtime data search unit (cache

processing mechanism, see Figure 1, element 129) determines if a class is stored in the runtime data (cache126).

- "...and an execution unit for executing the runtime data that have been loaded into the first memory unit in the accessible state..." (E.g., see Figure 1 (110) & Column 5, lines 32-35), wherein a processor for executing the runtime data is disclosed.
- "...wherein said first memory unit and said second memory unit are separate." (E.g., see Figure 1 (126) & Column 6, lines 30-43 + 17-21), wherein a processor 110 for executing the instructions enables the class processing mechanism 129 to retrieve the analyzed class data from the separate cache 126.

But **Blais** does not expressly disclose "linking" or "storing in a form of images".

However, **Sauntry** discloses:

- "...linking..." (E.g., see Figure 3b (354) & Column 9, lines 54-60), wherein references are loaded.
- "...in the form of images..." (E.g., see Figure 1 (110) & Column 3, lines 2-3), wherein generated class files are stored as a run-time image.

Blais and **Sauntry** are analogous art because they are both concerned with the same field of endeavor, namely, managing java class files. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Sauntrys'** class file storing method with **Blais'** class file retrieval method. The motivation was provided by **Blais** in developing a method to overcome the

shortcomings of java class file loading and parsing at run-time by a Java virtual machine so that Java programs may realistically be more able to run on memory-constrained platforms (see Column 2, lines 58-63).

In regard to claim 3, the rejections of base claim 1 are incorporated.

Furthermore, **Blais** discloses:

- "...the runtime data search unit causes the runtime data generated by the class loader unit to be stored in the second memory unit..." (E.g., see Figure 5 (532) & Column 8, lines 64-66), wherein the program information is stored in the cache.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Blais**.

In regard to claim 6, **Blais** discloses:

- "...a runtime data search unit to search runtime data necessary for execution of the Java program, by a class loader unit;; ..." (E.g., see Figure 5 & Column 8, lines 42-44), wherein the runtime data search unit (cache processing mechanism, see Figure 1, element 129) determines if a class is stored in the runtime data (cache 126).
- "...searching the requested runtime data for the Java program by the runtime data search unit ..." (E.g., see Figure 5 (522) & Column 8, lines 56-58), wherein the cache is searched.
- "...transmitting the searched runtime data to a first memory unit; and executing the runtime data transmitted to the first memory unit..." (E.g., see Figure 5 (526) & Column 8, lines 58-60), wherein the analyzed

program information is read from the cache entry (step 526) and used (step 528).

But **Blais** does not expressly disclose “requesting” the cache processing mechanism 129 (runtime search unit) to search. However, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that a needed class is equivalent to requesting the class, as it would be necessary to request a needed class in order to receive it. See claim 1 for the remaining limitations.

In regard to claim 9, the rejections of base claim 6 are incorporated.

Furthermore, **Blais** discloses:

- “...if it is determined from search results of the requested runtime data for the Java program that there are no relevant runtime data, loading Java program class files from an auxiliary memory...” (E.g., see Column 3, lines 20-23), wherein if there is no entry in the cache corresponding to the class the program information is analyzed and saved in a cache entry for future use.

See claim 1 for the remaining limitations.

In regard to claim 10, the rejections of base claim 9 are incorporated.

Furthermore, **Blais** discloses:

- “...the step of storing the generated runtime data...” (E.g., see Figure 4 & Column 9, lines 31-36), wherein.

But **Blais** does not expressly disclose “performed after the step of executing the runtime data transmitted to the first memory unit”. However, it would have been obvious

to one of ordinary skill in the art, at the time the invention was made to perform the storing step after execution rather than before as disclosed by **Blais**. The motivation to do so is that it is old and well known in the art to execute code steps in different order, particularly when the result (e.g., storing and executing) is the same and not effected by the order of execution. Accordingly, **Blais**' disclosure of storing and then executing the runtime information produces the same result as executing and then storing. Thus, storing after execution would have been obvious to one of ordinary skill in the art.

4. Claims **2, 4, 5, 8** and **11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Blais** in view of **Sauntry** and further in view of Rodriguez et al., US 6,725,241 (hereinafter **Rodriguez**).

In regard to claim **2**, the rejections of base claim **1** are incorporated. But **Blais** and **Sauntry** do not expressly disclose "...a garbage collector unit for collecting space unused in the first memory unit and allowing the unused space to be used again."

However, **Rodriguez** discloses:

- "...a garbage collector unit for collecting space unused in the first memory unit and allowing the unused space to be used again." (E.g., see Figure 4 & Column 3, lines 45-67), wherein a garbage collection unit for allowing unused space to be used again is disclosed.

Blais, Sauntry and **Rodriguez** are analogous art because they are both concerned with the same field of endeavor, namely, managing java virtual machine

memory. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Sauntrys'** garbage collector via least recently used method with **Blais and Sauntrys'** class file retrieval method. The motivation was provided by **Blais'** teaching to overcome the shortcomings of java class file loading and parsing at run-time by a Java virtual machine so that Java programs may realistically be more able to run on memory-constrained platforms (see Column 2, lines 58-63). Further motivation was provided by **Rodriguez's** disclosure of freeing memory in native method stacks (see Figure 2, 212 & Column 4, lines 30-33).

In regard to claim **4**, the rejections of base claim **1** are incorporated. But **Blais and Sauntry** do not expressly disclose "...by using a least recently used (LRU) method." However, **Rodriguez** discloses:

- "...by using a least recently used (LRU) method." (E.g., see Figure 4 & Column 3, lines 45-67), wherein a garbage collection unit for allowing unused space to be used again via the least recently used method is disclosed.

In regard to claims **5**, **8** and **11**, see claim **4**.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Romano whose telephone number is (571) 272-3872. The examiner can normally be reached on 8-5:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJR



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